



cofc

ATTORNEY DOCKET NUMBER: PAFE.P-001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Seitz et al.	Confirmation Number:	2282
Application Number:	09/439,915	Filing Date:	1999-11-12
Patent Number:	6,927,793	Issue Date:	2005-08-09
Title:	Method and Device for Forming an Image		

TRANSMITTAL LETTER

Commissioner for Patents
P O Box 1450
Alexandria, VA 22313-1450

Sir:

Please correct Figure 3 on the Certificate of Correction for the above-referenced patent.

Enclosed is a copy of the front page of the above-referenced patent and a copy of the Figure as submitted with the corrected margins on March 19, 2004. No fee is believed to be due with this paper as this error was made by the Patent Office. However, if necessary, the Commissioner is authorized to charge any fee which might be due to Deposit Account Number 15-0610.

Respectfully,
OPPEDAHL & LARSON, LLP

Carl Oppedahl, PTO Reg. No. 32,746
P O Box 5068
Dillon, CO 80435-5068
Tel.: 970-468-6600; Fax: 970-468-0104

Certificate
OCT 13 2005
of Correction



US006927793B1

(12) **United States Patent**
Seitz et al.

(10) **Patent No.:** **US 6,927,793 B1**
(45) **Date of Patent:** **Aug. 9, 2005**

(54) **METHOD AND DEVICE FOR FORMING AN IMAGE**

(75) **Inventors:** Peter Seitz, Urdorf (CH); Graham K. Lang, Hausen AM Albis (CH); Nicolas Blanc, Oberrieden (CH)

(73) **Assignee:** CSEM Centre Suisse d'Electronique et de Microtechnique SA, Neuchatel (CH)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** 09/439,915

(22) **Filed:** Nov. 12, 1999

(30) **Foreign Application Priority Data**

Nov. 18, 1998 (EP) 98121897

(51) **Int. Cl.** H04N 5/235

(52) **U.S. Cl.** 348/230.1; 348/297

(58) **Field of Search** 348/229.1, 230.1, 348/222.1, 297

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,647,975 A * 3/1987 Alston et al. 348/222.1
4,734,776 A 3/1988 Wang et al.
5,144,442 A * 9/1992 Ginosar et al. 348/222.1
5,309,243 A 5/1994 Tsai
5,572,256 A * 11/1996 Egawa et al. 348/296
5,671,013 A 9/1997 Nakao
6,011,251 A * 1/2000 Dierickx et al. 348/297
6,115,065 A * 9/2000 Yadid-Pecht et al. 348/308
6,175,383 B1 * 1/2001 Yadid-Pecht et al. 348/297
6,204,881 B1 * 3/2001 Ikeda et al. 348/362

6,429,898 B1 * 8/2002 Shoda et al. 348/316
6,441,851 B1 * 8/2002 Yonemoto 348/297
6,493,025 B1 * 12/2002 Kiriyama et al. 348/231.99
6,677,992 B1 * 1/2004 Matsumoto et al. 348/229.1

FOREIGN PATENT DOCUMENTS

EP 0 387 817 A2 9/1990

OTHER PUBLICATIONS

Aizawa K et al: "Computational Image Sensor for on Sensor Compression" IEEE Transactions on Electron Devices, vol. 44, No. 10, Oct. 1997, pp. 1724-1730, XP000703886.

* cited by examiner

Primary Examiner—Wendy R. Garber

Assistant Examiner—Jacqueline Wilson

(74) **Attorney, Agent, or Firm**—Oppedahl & Larson LLP

(57) **ABSTRACT**

The method for forming an image with a wide dynamic range makes use of an image sensor containing subsets of pixels that can be individually reset. After an initial reset (21), a pixel or row of pixels is exposed (22) for a first time interval and the gray value(s) ($P_{long}^{(255)}$) are read out (23) and stored (24). The pixel or row of pixels is then reset (25) and exposed (26) for a second, shorter time interval. The second gray value(s) ($P_{short}^{(255)}$) is/are read out (27) and either stored or immediately combined (28) with the first gray value(s) ($P_{long}^{(255)}$) by means of a merging function (f). The merging function (f) ensures a monotonic, smooth change in output from the lowest to the highest gray values. The procedure is repeated for all pixels or rows of pixels in the image sensor, thus obviating the need for the storage of complete images. The method reduces temporal aliasing to a minimum and eliminates spatial aliasing.

13 Claims, 3 Drawing Sheets



